WHAT IS CLAIMED IS:

1. A method for reducing noise effects in a system for measuring a physiological parameter, the method comprising the steps of:

generating a plurality of measurements derived from at least one wavelength of electromagnetic energy transmitted through living tissue;

comparing selected measurements with at least one expected measurement characteristic;

assigning one of a plurality of variable weights to each selected measurement based on the comparing step thereby generating a plurality of differently weighted measurements, the variable weights being assigned, in part, in response to a similarity between each selected measurement and a corresponding previous measurement, the variable weights comprising a plurality of different non-zero numbers; and

averaging a plurality of the differently weighted measurements to obtain a filtered measurement for use in estimating the physiological parameter.

2. A method for reducing noise effects in a system for measuring a physiological parameter, the method comprising the steps of:

generating a plurality of measurements corresponding to a series of cardiac pulses;

comparing each measurement with at least one expected measurement characteristic;

assigning a variable weight to each measurement based on the comparing step, thereby generating a plurality of differently weighted measurements; and

averaging a plurality of the differently weighted measurements from successive pulses to obtain a filtered measurement, each differently weighted measurement corresponding to a particular filtered measurement being similarly situated in a corresponding one of the successive pulses.

3. An apparatus for reducing noise effects in a system for measuring a physiological parameter, comprising:

means for generating a plurality of measurements corresponding to a series of cardiac pulses;

means for comparing each measurement with at least one expected measurement characteristic;

means for assigning a variable weight to each measurement based on the comparing step, thereby generating a plurality of differently weighted measurements; and

means for averaging a plurality of the differently weighted measurements from successive pulses to obtain a filtered measurement, each differently weighted measurement corresponding to a particular filtered measurement being similarly situated in a corresponding one of the successive pulses.

4. A method for reducing noise effects in a system for measuring a physiological parameter, the method comprising the steps of:

generating a plurality of measurements derived from one wavelength of electromagnetic energy transmitted through living tissue;

comparing selected measurements with at least one expected measurement characteristic;

assigning one of a plurality of variable weights to each selected measurement based on the comparing step thereby generating a plurality of differently weighted measurements, the plurality of variable weights comprising a plurality of different non-zero numbers; and

averaging a plurality of the differently weighted measurements to obtain a filtered measurement.

5. A method for reducing noise effects in a system for measuring a physiological parameter, the method comprising the steps of:

generating a plurality of time-based measurements which are not event driven, the time-based measurements being derived from at least one wavelength of electromagnetic energy transmitted through living tissue;

comparing selected time-based measurements with at least one expected measurement characteristic;

assigning one of a plurality of variable weights to each selected time-based measurement based on the comparing step thereby generating a plurality of differently

weighted time-based measurements, the variable weights comprising a plurality of different non-zero numbers; and

averaging a plurality of the differently weighted time-based measurements to obtain a filtered time-based measurement.

6. An apparatus for reducing noise effects in a system for measuring a physiological parameter, comprising:

means for generating a plurality of time-based measurements which are not event driven, the time-based measurements being derived from at least one wavelength of electromagnetic energy transmitted through living tissue;

means for comparing selected time-based measurements with at least one expected measurement characteristic;

means for assigning one of a plurality of variable weights to each selected time-based measurement based on the comparing step thereby generating a plurality of differently weighted time-based measurements, the variable weights comprising a plurality of different non-zero numbers; and

means for averaging a plurality of the differently weighted time-based measurements to obtain a filtered time-based measurement.

7. A method for measuring a blood constituent using data comprising a single data set, the method comprising the steps of:

determining a plurality of possible blood constituent values using a plurality of blood constituent value calculators, each of the blood constituent value calculators using the single data set, each of the possible blood constituent values having a confidence level associated therewith based on at least one quality metric; and

arbitrating between the plurality of possible blood constituent values with regard to the confidence levels to determine a measure of the blood constituent.

8. An apparatus for measuring a blood constituent using a single data set, comprising:

means for determining a plurality of possible blood constituent values using a plurality of blood constituent value calculators, each of the blood constituent

value calculators using the single data set, each of the possible blood constituent values having a confidence level associated therewith based on at least one quality metric; and

means for arbitrating between the plurality of possible blood constituent values with regard to the confidence levels to determine a measure of the blood constituent.

9. A method for generating a pulse rate of a patient using data corresponding to at least one wavelength of electromagnetic energy transmitted through tissue of the patient, the method comprising the steps of:

defining a comb filter to isolate signal energy in the data corresponding to a fundamental frequency and related higher frequency components thereof;

determining a particular frequency which optimizes energy at an output of the comb filter; and

generating a filtered pulse rate corresponding to the particular frequency.

10. An apparatus for generating a pulse rate of a patient using data corresponding to at least one wavelength of electromagnetic energy transmitted through tissue of the patient, comprising:

means for defining a comb filter to isolate signal energy in the data corresponding to a fundamental frequency and related higher frequency components thereof;

means for determining a particular frequency which optimizes energy at an output of the comb filter; and

means for generating a pulse rate corresponding to the particular frequency.

11. A method for determining a patient's pulse rate using data comprising a single data set corresponding to energy transmitted through the tissue of a patient, the method comprising the steps of:

determining a plurality of possible pulse rates using a plurality of pulse rate finders, each of the pulse rate finders using the single data set, each of the possible pulse rates having a confidence level associated therewith based on at least one quality metric; and

arbitrating between the plurality of possible pulse rates with regard to the confidence levels to determine the patient's pulse rate.

12. A method for determining a pulse rate of a patient using data corresponding to at least one wavelength of electromagnetic energy transmitted through tissue of the patient, the method comprising the steps of:

tracking a fundamental frequency using an adaptive comb filter to filter the data and to thereby generate a first pulse rate, the first pulse rate having a first confidence level associated therewith based on at least one quality metric;

comparing the data to a predetermined waveform template to generate a second pulse rate, the second pulse rate having a second confidence level associated therewith based on the at least one quality metric; and

arbitrating between the first and second pulse rates with regard to the first and second confidence levels to determine the patient's pulse rate.

13. In a system for measuring a physiological parameter using at least one wavelength of electromagnetic energy transmitted through living tissue, a method for determining an operational status of the system comprising the steps of:

receiving a data signal from at least one sensor;

determining whether the received data signal is representative of the physiological parameter by sensing whether the at least one sensor is secured to the living tissue; and

generating a status signal representative of the operational status of the system based on the determining step.

14. An apparatus for reducing noise effects in a system for measuring a physiological parameter, comprising:

means for generating a plurality of measurements derived from at least one wavelength of electromagnetic energy transmitted through living tissue;

means for providing a signal indicative of the at least one wavelength of electromagnetic energy;

means for comparing selected measurements with at least one expected measurement characteristic;

means for assigning one of a plurality of variable weights to each selected measurement based on the comparing step thereby generating a plurality of differently weighted measurements for each wavelength, the variable weights being assigned, in part, in response to a similarity between each selected measurement and a corresponding previous measurement, the variable weights comprising a plurality of different non-zero numbers;

means for averaging a plurality of the differently weighted measurements to obtain a filtered measurement for use in estimating the physiological parameter; and

means for calibrating the system to measure the physiological parameter in response to the signal indicative of the at least one wavelength of electromagnetic energy.

15. A monitor for measuring a physiological parameter, the monitor being for use with a sensor having emitting means for emitting at least one wavelength of electromagnetic energy, sensing means for sensing the electromagnetic energy and for generating a first signal representative thereof, means for detachably coupling the sensor to the oximeter and for providing communication of signals between the sensor and the oximeter, and means for providing a second signal indicative of the at least one wavelength of electromagnetic energy, the monitor comprising:

means for generating a plurality of measurements derived from the first signal;

means for comparing selected measurements with at least one expected measurement characteristic;

means for assigning one of a plurality of variable weights to each selected measurement based on the comparing step thereby generating a plurality of differently weighted measurements, the variable weights being assigned, in part, in response to a similarity between each selected measurement and a corresponding previous measurement, the variable weights comprising a plurality of different non-zero numbers;

means for averaging a plurality of the differently weighted measurements to obtain a filtered measurement for use in estimating the physiological parameter; and

means for calibrating the monitor to measure the physiological parameter in response to the second signal.

16. A method for measuring a blood constituent using data corresponding to a wavelength of electromagnetic energy transmitted through tissue of a patient, the method comprising the steps of:

filtering the data such that motion and noise energy not at integer multiples of a heart rate of the patient are attenuated, thereby generating filtered data;

comparing selected filtered data with at least one expected data characteristic;

assigning one of a plurality of variable weights to each selected filtered data based on the comparing step thereby generating a plurality of differently weighted filtered data, the variable weights comprising a plurality of different non-zero numbers; and

averaging a plurality of the differently weighted filtered data to obtain a twice-filtered data for use in estimating the blood constituent.

17. A method for calculating oxygen saturation of hemoglobin in arterial blood using data corresponding to a plurality of wavelengths of electromagnetic energy transmitted through tissue of a patient, the method comprising the steps of:

determining extinction coefficients corresponding to the plurality of wavelengths; and

calculating values proportional to total hemoglobin and oxygenated hemoglobin directly from the data and the extinction coefficients.